



**SOLVING
THE GLOBAL
DECOMMISSIONING
CHALLENGE WITH
ASBESTOS WASTE**

A WORLDWIDE CHALLENGE

With 200 reactors due to be shut down in the next 25 years, we face a worldwide decommissioning challenge that includes hundreds of thousands of tonnes of asbestos and asbestos contaminated waste with considerable uncertainty around disposal routes.

In the UK alone, asbestos and asbestos containing waste is expected to exceed 47,000 tonnes¹ from 17 historic nuclear sites and 10,000 plants and buildings between 2013 and 2130². With finite capacity within the low level waste (LLW) repository and hazardous waste landfill sites, escalating costs associated with disposal and increasing environmental and social pressures, there is a growing need to find alternative disposal methods.



¹ LAW Asbestos and Asbestos Containing Waste Gate B (Preferred Options) Study, February 2016 (http://llwrsite.com/wp-content/uploads/2016/03/NWP_REP_106-LLW-Asbestos-and-Asbestos-Containing-Waste-Gate-B-Preferred-Options-Study-Report.pdf)

² NDA strategy 2016 (<https://www.gov.uk/government/consultations/nuclear-decommissioning-authority-draft-strategy>)

A COMMERCIALY AVAILABLE GLOBAL SOLUTION

ARI Global Technologies provides a robust thermochemical conversion technology (TCCT) that destroys asbestos fibres and produces a non-hazardous product that can be used in many construction applications and as a grout stabilisation medium for radioactive waste.

Suitable for the treatment of radiologically contaminated asbestos and asbestos containing wastes, this proven, commercially available technology delivers many technical, cost and environmental benefits compared to landfill or other technologies.

This exciting patented technology has set the worldwide precedent for managing asbestos waste and helps solve the global decommissioning challenges associated with this problematic waste.



EXPERIENCE THE BENEFITS

- **Suitable for all types of asbestos and for radioactive waste**
The thermochemical conversion technology (TCCT) process is suitable for all types of friable and non-friable asbestos and effectively immobilises radioactive elements such as cerium, caesium, plutonium, uranium and other toxic metals.
- **Commercially viable and available**
This technology is available now and provides a commercially viable alternative to landfill disposal.
- **Technologically mature**
ARI is the most technologically mature and demonstrated technology available worldwide for the treatment of asbestos.
- **Nationally and internationally compliant**
The TCCT process is compliant with national and international legislation for the treatment of low activity waste asbestos and asbestos containing wastes.
- **Permanent solution**
Our technology permanently and irreversibly destroys asbestos while converting it into a non-toxic product that can be recycled in a number of construction applications. Products from the destruction of radioactive asbestos can be used as grout stabilisation for radioactive waste.
- **Reduces volume of waste**
The thermochemical conversion technology (TCCT) process typically reduces the volume of the waste treated by between 50 and 90 per cent.
- **Decreases cost of asbestos treatment**
With the rising cost of asbestos disposal, our unique process is a cost effective solution for asbestos treatment, reducing what was typically an expensive treatment process and making it commercially viable.
- **Low health & safety risk**
The operating equipment design, and operating and safety procedures of our TCCT are well established and result in a very high level of safety for workers and the public.

ABOUT THE TECHNOLOGY

The TCCT unit consists of a modular system including a waste preparation area, primary waste converter, emission control system, control system and a product handling system.

The waste preparation system conditions the waste for introduction into the primary waste converter. In the converter, the waste is subjected to conditions that result in complete destruction of asbestos fibres in a very short period of time.

Asbestos is made from minerals of the serpentine and amphibole groups and are hydrated silicates which naturally decompose at between ~500°C and ~800°C. However, this reaction is slow even at much higher temperatures making the minerals difficult to destroy. The ARI process introduces a non-hazardous fluxing agent to asbestos. This flux accelerates the decomposition reaction and results in the complete and irreversible transformation of all asbestos minerals into common volcanic-type minerals like olivine, wollastonite and diopside. The reactions take place without significant melting of the material. The high operating temperatures and chemical reactions also destroy all organic compounds and immobilise metals and radionuclides.

The emission control system assures that the system complies with all regulatory standards and offers superior protection of the public and the environment.

Once the asbestos is destroyed in the primary converter, the treated product is continuously discharged to temporary storage containers pending confirmatory analysis.

ARI Global Technologies can build stationary or transportable units of varying capacity. A typical 50 tonne per day unit covers a footprint of only 60m by 45m.

TECHNOLOGY HISTORY

This unique thermochemical conversion technology (TCCT) was developed in the US by ARI Technologies Inc and granted a National Operating Permit by the US Environment Protection Agency (EPA).

Between 2004 and 2009, over 1,000 tonnes of asbestos waste was successfully treated during a five year commercialisation programme. The technology was successfully used to treat asbestos by the US Department of Defense, Department of Energy and EPA as well as a number of private organisations.

In 2014, the ARI global patents were bought by ARI Global Technologies.



ABOUT OUR GROUP

ARI Global Technologies is part of Windsor Integrated Services Group which offers a range of products and services designed to help businesses manage their resources and waste in a more sustainable and compliant way.

The group also includes:



Windsor Waste Management

A market leader in the asbestos disposal industry and a significant provider of total waste management services for construction and related industries across the UK



Hazibag UK

A greener, safer, easier and more compliant way to contain and transport solid hazardous waste that overcomes the limitations of traditional containers



Waste Cost Reduction Services

Providing national waste management solutions for businesses with multiple sites and waste streams that are looking for increased recycling, lower costs and better solutions



Waste Confidence

Authenticating businesses zero waste to landfill claims with the UK's only independently verified zero waste to landfill certification scheme

"This is such an exciting development for the asbestos industry and one that makes me proud of the continual drive to raise standards which is synonymous with being an ACAD member."

Graham Warren
ACAD Manager, TICA-ACAD

"As the UK's leading asbestos removal association, ARCA is proud to support ARI Global Technologies. We are very excited to see this more environmentally responsible and cost effective way to treat asbestos become a reality in the UK, stopping waste going to landfill and turning it instead into a harmless product that can be recycled."

Steve Sadley
Chief Executive, ARCA
and Patron of ARI Global
Technologies

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